

REMARKS

Claims 1, 3-24 and 26-44 are pending in the present application. Applicants thank the Examiner for the personal interview conducted on September 17, 2009. Claims 1, 22, 24 and 36 have been amended essentially as discussed in the interview. No new matter has been added. Applicants respectfully request reconsideration of the application in view of the above amendments and remarks below.

Rejection Under 35 U.S.C. 103

Claims 1, 3-9, 11-24 and 26-41 have been rejected as obvious over “Surface Chemistry for Atomic Layer Growth” to George et al. (hereinafter “George”) in view of Sandhu et al. (U.S. Patent No. 6,313,035), Journal De Physique IV to Leskela et al. (hereinafter “Leskela”), U.S. Patent No. 6,015,590 to Suntola et al. (hereinafter “Suntola”) and “Aminosilane as a coupling agent...” to Juvaste et al. (hereinafter “Juvaste”). This rejection is respectfully traversed.

Applicants submit that the cited references fail to teach or suggest the combinations recited in the claims as previously presented. However, to facilitate prosecution, and in view of the interview between Applicants’ representative and the Examiner as set forth in the summary above, Applicants have amended independent Claims 1, 22, 24 and 36 to indicate that each reactant flows continuously while it is provided to the reactor. Applicants submit that the cited references fail to teach or suggest at least this feature.

George discloses a ‘static fill’ or ‘backfill’ reactor, which operates by contacting a substrate with a reactant and allowing the reactant to soak for *long exposure times*. (See Applicants’ Amendment and Declaration of Suvi Haukka filed April 20, 2009). Importantly, the reactant is not flowing during the exposure time. For example, George teaches exposure times of SiCl₄ and H₂O for as long as 72 minutes. (See George, page 13123). Applicants submit that George’s teaching of static reactant exposure times teaches away from a reactor in which reactants *flow continuously*. Thus, George fails to teach or suggest a process in which reactants flow continuously from an inlet of the reactor to an outlet of the reactor.

Applicants note that the Examiner asserts on page 10 of the Office Action that George does not limit its disclosure to a static fill reactor. Applicants disagree, but nevertheless, Applicants submit that George’s alleged failure to limit its disclosure to a static fill reactor would

still not be sufficient to establish a *prima facie* case of obviousness. In order to establish a *prima facie* case of obviousness, the references must teach or suggest all of the claim limitations. (See M.P.E.P. § 2142). However, there is no suggestion whatsoever in George that the reactants “flow continuously” as recited in the amended claims, or in a flow type reactor as described, e.g., in Applicants’ Amendment and Declaration of Suvi Haukka filed April 20, 2009. Moreover, given the length of time that a substrate soaks the reactants in George, Applicants submit that the skilled artisan would not have believed that a flow-type reactor would be suitable to use in the methods taught by George, and would appreciate that using a flow type reactor would change the nature of the process disclosed in George. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. (*In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP 2143).

Applicants also maintain that the observed ALD growth of metal silicon oxides by the claimed methods was unexpected, and that unexpected results rebut any *prima facie* case of obviousness, as discussed in detail in Applicants’ prior response dated April 20, 2009. (See *In re Soni*, 54 F.3d 746 (Fed. Cir. 1995)). In response, the Examiner states on page 10 of the Office Action that George teaches ALD growth rates of silicon dioxide (1.1 Å/AB cycle) equal to the surprisingly high growth rates of metal silicon oxides reported by Applicants. However, the growth rates disclosed in George were obtained using a static fill reactor with very long precursor exposure times. There is no teaching or suggestion in George that the reported growth rates could be obtained using reactants that flow continuously in a flow type reactor, as in the amended claims.

Finally, Applicants note that the Examiner maintains various positions about the teachings of individual references. However, Applicants submit that the Examiner has not provided sufficient reasoning *with rational underpinning* to support the conclusion that it would have been obvious to combine the references. (See *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385, 1396 (2007), emphasis added). On page 12 of the Office Action, the Examiner merely maintains that the skilled artisan would have combined the references in the manner alleged “to produce useful devices.” Applicants submit that this

statement alone is insufficient reasoning to support the Examiner's assertion of obviousness in combining all the different cited references.

In addition, Applicants note that the Examiner concedes that George fails to disclose a multicomponent thin film comprising a silicon and a metal, but alleges that Sandhu discloses this feature. (Office Action, page 3). The Examiner also concedes that George and Sandhu together fail to disclose a plurality of consecutive deposition cycles that each deposit only a metal silicon oxide, but alleges that Leskela discloses this feature. (Office Action, page 4). The Examiner also concedes that George, Sandhu and Leskela together fail to disclose purging the reactor with an inert gas after each pulsing, but alleges that Suntola teaches this feature. (Office Action, pages 4-5). The Examiner also appears to concede that George, Sandhu, Leskela and Suntola together fail to disclose a flow-type reactor, but alleges that Juvaste discloses this feature. (Office Action, page 5).

Applicants submit that the Examiner has not considered the invention as a whole and that reliance on multiple secondary references violates the well-established standard that the "'as whole' instruction in title 35 prevents evaluation of the invention *part by part*." (See *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004) (emphasis added); *Gillette Co. v. S.C. Johnson & Son., Inc.*, 919 F.2d 720, 16 USPQ2d 1923 (Fed. Cir. 1990). "Focusing on the obviousness of substitutions and differences, instead of on the invention as a whole, is a legally improper way to simplify the often difficult determination of obviousness.").

For at least the forgoing reasons, Applicants respectfully request withdrawal of the rejections to Claims 1, 22, 24 and 36.

Claims 3-9, 11-21, 23, 26-35 and 37-41 depend from Claims 1, 22, 24 and 36 and recite all the elements of Claims 1, 22, 24 and 36 in addition to reciting further distinguishing features. Thus, Applicants respectfully request withdrawal of the rejection of these claims as well, for at least the reasons set forth above.

Claim 10 is rejected as unpatentable over George in view of Sandhu, Leskela, Suntola and Juvaste, and further in view of U.S. Patent No. 5,891,744 to Lowrey et al. (hereinafter "Lowrey").

Application No.: 10/678,766
Filing Date: October 2, 2003

Claim 10 depends from Claim 1 and recites all the limitations of Claim 1 in addition to reciting further distinguishing features. Applicants submit that Lowrey fails to cure the deficiencies of George, Sandhu, Leskela, Suntola and Juvaste. Lowrey is only cited for allegedly disclosing deposition on a dielectric hemispherical grain area to form a capacitor. (Office Action at page 8). Thus, Applicants respectfully request withdrawal of the rejection to Claim 10 for at least the reasons set forth above.

Application No.: 10/678,766
Filing Date: October 2, 2003

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Co-Pending Applications of Assignee

Applicant wishes to draw the Examiner's attention to the following co-pending applications of the present application's assignee.


Docket No.	Serial No.	Title	Filed
SEPP21.001APC	10/148525	METHOD OF GROWING OXIDE FILMS	08/27/02
SEPP21.001C2	11/615827	METHOD OF GROWING OXIDE FILMS	12/22/06

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: December 22, 2009

By: 
Soyoung Jung
Registration No. 58,249
Attorney of Record
Customer No. 20,995
(415) 954-4114